May 12, 1942. B. F. FITCH 2,282,353

CONVEYER MECHANISM

Filed Aug. 2, 1940

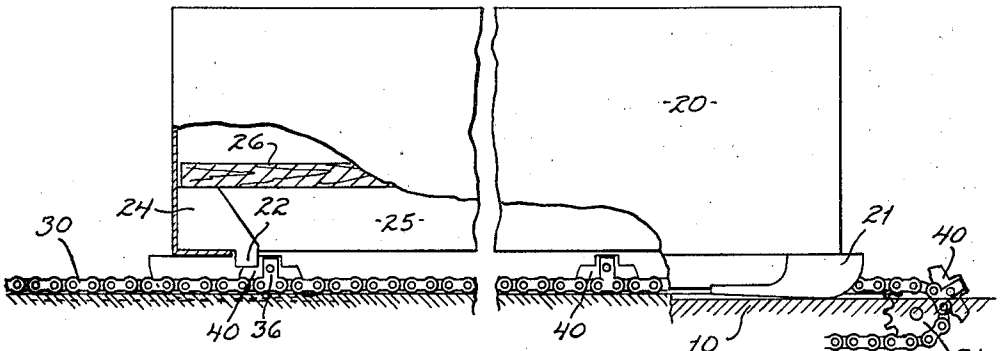


FIG. 1

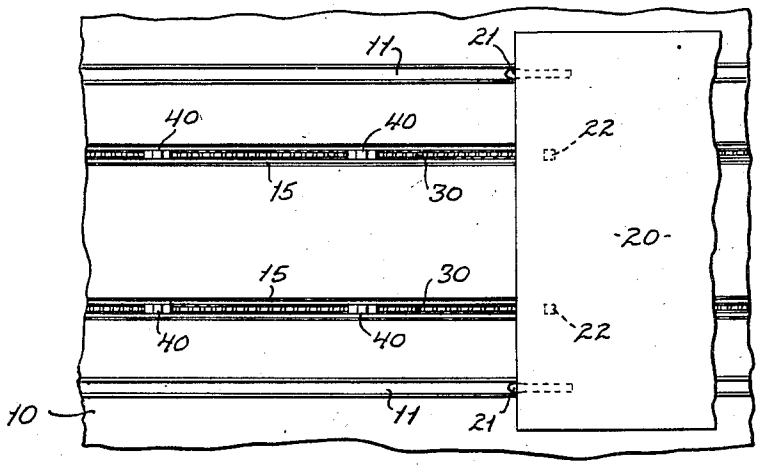


FIG. 2

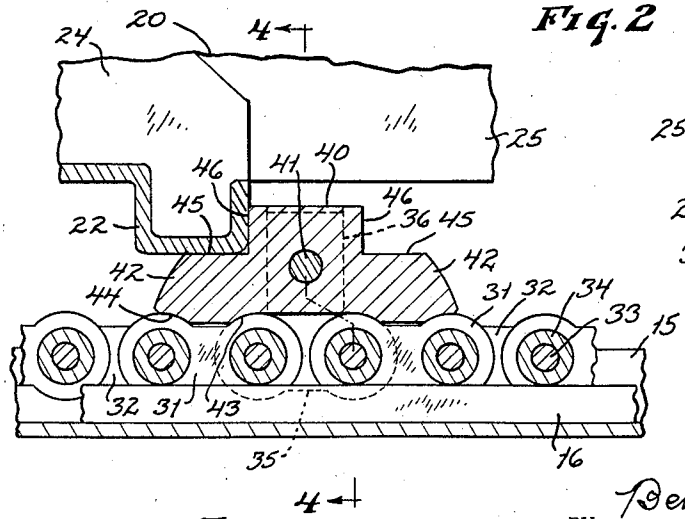


FIG. 3

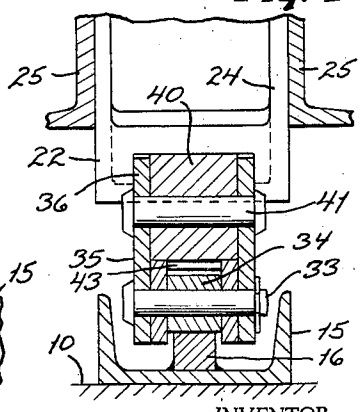


FIG. 4

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CONVEYER MECHANISM

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Application August 2, 1940, Serial No. 349,760

9 Claims. (Cl. 198—173)

This application is a continuation in part of my copending application, Serial No. 329,377, filed April 12, 1940, for a Freight handling apparatus. The invention of the present application relates to a system of transferring freight by means of containers carrying the freight, and chain conveyers having lugs adapted to engage the container so that the chain may propel the container, while the container is supported independently of the chain.

In such an installation, the weight of the container with its load and its resistance to movement, introduces a heavy lateral stress on the driving lug of the chain, tending to tip the lug and the corresponding portion of the chain, so that an ordinary lug might slip free from the container, thus preventing the propelling action or reducing its efficiency.

The object of my invention is to provide lugs on the chain so formed and so engaged to the container so that the lug will not tip, but will maintain a continuous driving engagement with the container even though there is a heavy lateral stress on the lug.

More particularly, in my invention I provide the container, the pair of parallel skid rails on its base, while the support along which it is to be skidded is provided with a pair of upwardly facing guiding channels for the skid rails. There are preferably two parallel endless chains operating in vertical planes, the upper reaches of these chains being suitably supported to prevent the chain sagging. The chains are provided with lugs which extend in a direction which is upward from the upper reach of the chain, and such chain lugs at some distance above the chain proper, coact with downwardly extending lugs on the container.

Now when such a chain moves horizontally, with the vertical face of its lug engaging a vertical face of the container lug, it is obvious that the chain tends to pull the bottom of the chain lug in one direction, whereas the resistance of the container lug of the upper portion of the chain lug tends to resist its movement, so that the forces form a couple tending to rotate the lug about an intermediate horizontal axis. To prevent such rotating I form the lugs in a manner to engage the chain for a considerable extent and further in a manner to not only engage the vertical surface of the container lug, but also the under horizontal surface of such lug.

The extended engagement of the chain lug with the chain links distributes the tipping stress along the chain, and the engagement of the upper surface of the lug with the horizontal bottom of the container lug prevents any lifting of the lug (due to the weight of the container and its load) and thus the tendency of the lug to tip is entirely overcome and an effective engagement with the container is maintained.

My invention is illustrated in the accompanying drawing and is hereinafter more fully described, and the essential novel features are set out in the claims.

In the drawing, Fig. 1 is an elevation of a portion of my chain conveyer mounted on a platform and a portion of a container resting on that platform in cooperation with a lug on the chain; Fig. 2 is a fragmentary plan of the parts shown in Fig. 1; Fig. 3 is a sectional elevation of the chain and its lug coacting with a lug on the container; Fig. 4 is a transverse section of the chain and a portion of the container, as indicated by line 4—4 on Fig. 3.

As shown in the drawing, 10 indicates a suitable platform and 20 a container adapted to be propelled over the platform, the platform is shown as provided with a pair of upwardly facing channels 11 and the container with a pair of skid rails 21 on its underside adapted to occupy the channels. The container is accordingly supported directly on the platform by means of its skid rails.

To propel the container across the platform, I provide a pair of endless chains 30, each located in a vertical plane, these chains being looped about sprockets, one of which is shown at 31 in Fig. 1, and may serve to drive the chain. Suitable rigid supports are provided on the platform for the chain. For this purpose, I have shown a pair of parallel channels 15 on the bases of which are supporting bars 16 which support and guide the chain.

The chain is of the roller type and comprises two side strands, each strand composed of inner links 31 and outer links 32 and transverse pins 33 which form the pivots for the links of both strands of the chain. Surrounding the pivot pins 33 are rollers 34 which rest on the supporting bars 16. As the driving sprocket rotates, the chain is accordingly propelled, carrying its upward reach lengthwise of the supporting bar 16 with the rollers 34 rolling onto such bar.

At separated equi-distant regions of the chain, I provide special outer links 35 which in the body of the link are formed like the links 32 and take the place of them, but also have portions extending at right angles to the body of the link. These portions accordingly project upwardly on

the upper reach of the chain and provide a pair of opposed parallel flat bars **36**. These bars carry specially formed lugs about to be described.

The lugs of this invention, designated **40** are blocks having grooves in their opposite sides in which are snugly fitted the bars **36** and the bars and blocks are secured together by a rivet **41**. The block extends in opposite directions from the attached portion in the form of two wings **42**, the under surface of which is concaved in one direction adjacent the bars **36** as indicated at **43** and in another direction near the end of the wing as indicated at **44**. The two curved faces **43** and **44** on the underside of the block are of the same curvature as that of the inner links **31** where they extend around the pivot pins, with the result that the block is not only carried by two outer links but rests on the shoulders of four inner links, that is the two inner links pivoted to such attaching link in each strand of the chain.

The construction described makes a very effective engagement with a considerable longitudinal region of the chain, and prevents tipping of the block independently of such chain region, while in operation the chain links and the ends of the loop are free to bend away from the block, as the chain passes around the sprocket wheel.

Due to the tautness of the chain, it would require considerable stress against the upper portion of the block **40** to tip that portion of the chain which it engages, but such tipping might take place to the extent allowed by the chain if there were only an engagement of the vertical face of the block with the vertical face of the container lug which it engages. To prevent such possible tipping of the block and associated chain links as a unit, I form the block **40** with horizontal shelves **45** adapted to engage the under face of the lug **22** on the container, at the same time that the vertical face **46** of the block engages the vertical face of the container lug, as illustrated in Fig. 3.

It will be seen from the description given, that when the container rests on the support and the chain shown in Fig. 3, moves, for example, toward the left, the block-shelf **45** comes under the lug and then the vertical surface **46** of the block engages the vertical face of the container lug, and then the continual movement of the chain toward the left must draw the container with it and the block cannot tip because the weight of the container and its load acting downwardly on the shelf **45** positively prevents such action.

I have accordingly, provided for an effective maintenance of the chain in co-action with the container to propel the latter even though it may be very heavy and have a very decided resistance to movement, and I relieve the chain of the abnormal tension to which it might be subjected if the block together with its associated chain links could tip.

While Fig. 3 of the drawing shows the shelf **45** in actual contact with the bottom surface of the container lug, it is to be understood that in practice there is sufficient clearance between these parts to enable the shelf **45** to pass readily under the lug of the container.

The container lugs may be of any suitable form and carried in any described manner in the container. As shown, they are on castings **24** which are secured between floor beams **25** of the container which carry the floor **26** thereof.

I claim:

1. An endless propelling chain made of two strands of overlapping links with pivot pins connecting the links of each strand together and joining the two strands, two opposed chain links of the two strands having extensions at substantially right angles to the length of the links, blocks between said extensions secured thereto, said blocks extending in each direction from their secured region to provide wings adapted to engage the shoulders of the four links of the two chain strands which are pivoted to the two links which carry the block.

2. The combination of an endless propelling chain made of two strands of overlapping links with pivot pins connecting the links of each strand together and joining the two strands and rollers embracing the pins, a substantially horizontal supporting bar for the upper reach of the chain on which said rollers rest, two opposed chain links of the two strands having extensions at substantially right angles to the length of the links, blocks between said extensions rigidly secured thereto, said blocks extending from their secured region to provide a portion to engage the shoulders of two links of the two chain strands which are pivoted to the two links which carry the block.

3. In a chain conveyer, the combination with a support of a roller-chain having means for driving it, said chain comprising two strands each composed of inner links and outer links overlapping the inner links and transverse pins which pivotally connect the overlapping links of the two strands and accordingly connect the two strands together, rollers surrounding said pins and adapted to rest on longitudinal bars carried by the support, a pair of outer links which are opposite each other in the two strands having extensions which project upwardly from the upper reach of the chain, a block between said extensions having grooves in its opposite faces in which the extensions lie, a pin connecting the extensions to the block, the block extending in each direction from the grooved region lengthwise of the chain and having curved surfaces on its underface adapted to engage the shoulders of the four inner links which are pivotally connected to the two outer links which carry the block.

4. A conveyer chain comprising two strands each composed of inner links and outer links overlapping the inner links and transverse pins which pivotally connect the overlapping links of the two strands and accordingly connect the two strands together, a pair of outer links which are opposite each other in the two strands having extensions which project at right angles to the body portion of such links, a block between said extensions having grooves on its opposite faces on which the extensions lie, a pin rigidly attaching the extensions to the block, the block extending in each direction from the grooved region lengthwise of the chain and having curved surfaces on its under face adapted to engage the shoulders of the four inner links which are pivotally connected to the two outer links which carry the block.

5. The combination with a support of a propelling chain thereon, said chain comprising two strands each composed of inner links and outer links overlapping the inner links and transverse pins which pivotally connect the overlapping links of the two strands and accordingly connect the two strands together, rollers surrounding said pins and adapted to rest on longitudinal bars carried by the support, a pair of outer links which

are opposite each other in the two strands having extensions which project upwardly from the upper reach of the chain, a block between said extensions attached to them, the block extending in each direction from the attached region lengthwise of the chain and having curved surfaces on its under face adapted to engage the shoulders of the four inner links which are pivotally connected to the two outer links which carry the block, the block being formed with rabbets in its upper shoulders providing vertical and horizontal engaging surfaces.

6. In a freight handling apparatus, the combination of an endless propelling chain, said chain being composed of two sets of outer links and two sets of inner links, the inner links overlapping the outer links, and transverse pins connecting said links, some of the outer links having upwardly extending projections and blocks mounted between said projections and pinned thereto, each block having an intermediate projecting portion and wings extending therefrom in each direction, each wing being adapted to overlap and rest on the chain in front of and behind the links to which the block is attached.

7. In a freight handling apparatus, the combination of a support, an endless chain thereon, a series of blocks permanently carried by the chain in spaced relation, each block having an intermediate projecting portion rigidly attached to a link and wings extending oppositely in the direction of the chain and adapted to bear on other links thereof than the links which carry the block, said blocks adapted to engage a container mounted on the support and having a downward projection.

8. In a freight transferring apparatus, the combination of a support, an endless chain thereon composed of two sets of inner links and two sets of outer links, the outer links overlapping the inner links, the inner links being spaced apart, and transverse pins through the overlapping portions, each pin connecting two inner and two outer links, some of said links having projecting portions, blocks mounted between said projecting portions and permanently and rigidly pinned thereto, each block extending in each direction from its region of attachment and having curved under-faces to engage the chain adjacent four of the chain pins, whereby the blocks may not rock in either direction with reference to a flat reach of the chain, said blocks being adapted to engage a container mounted on the support and having a downward projection.

9. The combination of a support, an endless chain thereon operating in a vertical plane and having two sets of pivotally connected links with rollers between them, a horizontal bar extending lengthwise of the chain engaged by rollers between successive blocks hereinafter mentioned on the upper reach of the chain, a series of blocks secured in spaced relationship to the chain in such position that they extend upwardly from the upper reach of the chain, each block being rigidly secured to a chain link and extending longitudinally to engage links on opposite sides of the link carrying the block.

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